MULTIFUNCTIONAL ENERGY-ADJUSTABLE NET CONTROL AIR CONDITIONER

FIELD OF THE INVNETION

The present invention relates to a multifunctional energy-adjustable net control air conditioner, wherein in winter, or low temperature days, the present invention is used as a heater. The heater can provides hot water and vapor. Three way servo valves are used as switches so that air conditioner can be used in all the years without needing boiler. No cooling tower is used since the heat source in the high pressure side is absorbed by heat exchangers. The multifunctional air conditioner is used with multifunctional exchangers so as to have a preferred effect. The present invention can be used to conventional, frequency varied or DC elements so as to save power.

BACKGROUND OF THE INVENTION

Referring to Fig. 1, a current widely used water cooled air condition is illustrated. In Fig. 1, an compressor A serves to compress refrigerant into high temperature and high pressure refrigerant and then the refrigerator is sent into a condenser B. Besides, a cooling tower C sends water into the condenser B for heat exchanger. Then high temperature and high pressure refrigerant is condensed into high pressure liquid which is then transferred into a liquid tank E. Then a pipe F serves to dispatch the liquid to a plurality of expansion valves G for expansion. Then the liquid is sent into an evaporator H for forming as a low pressure liquid so as to achieve the object of heat absorption. Moreover, by the function of heat exchanger, a cooling room effect is

generated so as to provide cold air. Finally, heat is absorbed to form a low pressure liquid. Then the refrigerant is sent back to compressor A through a low pressure tube 1 for compression. The thermal cycle is repeated. This water cooling air conditioner is mainly used to a larger load.

With reference to Fig. 2, further a fan serves to cool a gas cooling air condition having the high temperature and high pressure refrigerant therein. This air condition can provide a cooling room effect in summer. The high temperature heat at the high pressure side will be dispersed to the air with the fan J or the cooling tower C so that heat is consumed. Thereby, the "hot island" effect is generated in the city and the warm room effect of the earth is increased.

There are many patents such as Taiwan Patent Nos. 1741449、406792、356933、371475、394366、427487 disclose some methods to dissolve this phenomenon, but they are used only at summer when air conditioner is used. When the air conditioner is not used, generally, over half year of one year, they are useless. Thereby, it cannot achieve the object of power saving, effective management and convenient maintenance.

SUMMARY OF THE INVENTION

Accordingly, the primary object of the present invention is to provide a multifunctional energy-adjustable net control air conditioner which comprises a first loop having pipes containing a liquid storage tank, an compressor, a first three way servo valve, a first condenser, a first check valve, a second three way servo valve, a first check valve, a second expansion valve, and a first evaporator which are serially connected; a

second loop containing the first condenser, a heat exchanger, a condensing cyclical motor, and a first heater which are serially connected; a third path having a pipe containing the first heater, a second heater which are serially connected and a second two way servo valve and a second two way servo valve which are connected to the second heater in parallel; a fourth loop having pipes includes the first evaporator, a second heat exchanger and an evaporation cyclic motor which are serially connected; a fifth path containing the three way servo valve, a second check valve, a second expansion valve, a second evaporator and the liquid storage tank; a second condenser and a second check valve being serially and sequentially connected between the second three way servo valve and the front end of the first three way servo valve; a fan being connected between the second condenser and the second evaporator; a first pipe being connected between the second expansion valve and one end of the second evaporator far away from the second expansion valve; and a first pipe being connected between the second expansion valve and one end of the second evaporator far away from the second expansion valve.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

DESCRIPTION OF THE DRAWINGS

Fig. 1 is a structural schematic view of the prior art.

Fig. 2 is a structural schematic view of the prior art.

Fig. 3 is a structural schematic view of the present invention.

Fig. 4 is a structural schematic view of the multi-functional exchanger of the present invention.

Fig. 5 is a structural schematic view of the gas cooling structure of the present invention.

Fig. 6 is a schematic view of the gas cooling multi-functional exchanger of the present invention.

Fig. 7 is a schematic view of the multi-functional exchanger of the present invention.

Fig. 8 is a schematic view of the multi-functional exchanger of the present invention.

Fig. 9 is a schematic view showing the application of Fig. 5 of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The first embodiment of the present invention

(1) Referring to Fig. 3 and 8,

A multi-functional power integration system: air system output (hot water, cool water, cool gas, warm gas, moisture remove, adding moisture)

1. Hot water: in the compressing recycle process of Fig. 3, water hot flows through the condenser 5, output B of tube 42, and is transferred through the pump G in Fig. 8 and then flows into the storage tank K in Fig. 8 to return to A to exchange with the condenser so as to generate hot water 101 for use.
2. Ice water: in the compressing recycle process of Fig. 3, ice water flows through the evaporator 9, output D of the tube 52 to be transferred from the pump H in Fig. 8 to flow into the ice storage tank L to return to C so as to heat-exchange in the evaporator to

generate ice water 102.

3. Warm gas: Hot water is generated in the hot water tank K of Fig. 8, then is transferred by the pump Q to the multi-functional exchanger W (for heat exchanger) to return to the hot water storage tank K so as to generate heat power and then output from the fan 103 as warm gas.
4. Cool gas: The ice water storage tank L in Fig. 8 generates ice water which flows through the pump M and then to multi-functional exchanger X (for heat exchanger) to the ice water storage tank L so as to generate cold power to be output from fan 103 as cool gas.
5. Moisture remove: Hot water and ice water are generated in the hot water storage tank K and ice water storage tank L. The ice water flows through the pump L, pump L to the multi-functional exchanger Y (heat exchange) and then to the ice water storage tank L and hot water storage tank K so as to generate cool and hot water to be output in 105 by the fan so as to achieve the function of moisture remove.
6. Vapor and moisture adding: the heater 17 operates to a gasifying setting temperature. Then fluid flows through the output E of the tube 33, and the two way valve 15 (ON) so as to generate vapor 16 for adding moisture.

(2) Description of the loop in Fig. 3,

1. In the loop B of the compressing recycle process, heat power is generated for use. When the temperature in the load end achieves a set value. The three way servo valve 3 operates. Hot gas flows through the heat exchanger 11 and drains out from

the motor 13. The cool power outputs D and loop C can operates.

2. The loop C in the output D of the compressing recycle, cool power generates for using by load. When the load end achieves a set temperature. The three way servo valve 7 operates. Cool gas through the heat exchanger 12 and is drain out from the motor 13. Hot power outputs B and the loop A can operate.
3. In the compressing recycle process, when the cool and hot power of the load achieves a set value, the three way servo valves 3 and 7 operated, and the main frame stops.

(3) The loop control description of Fig. 4 of the present invention.

1. The Figs. 3 and 4 have the same power function and heat exchanger 77 in Fig. 4 can be used for exchanging cool and hot fluid.
2. In the compressing recycle, the condenser 5 generates hot power and outputs from A and B so that temperature of the load achieves to a set value. The three way servo valves 3 and 19 operates . The heat exchanger 77 is as a condenser.
3. In the compressing recycle, the evaporator 9 generates cool power and outputs from C and D so that temperature of the load achieves a set value. The three way servo valve 7 operates and the heat exchanger 77 as an evaporator.
4. In the compressing recycle, when the fluids output to load from the condenser 5 and evaporator 9 to achieve a set value, the three way servo valves 7 and 5 operates and the mainframe stops.

Second embodiment of the present invention

(4) Description of loop in Fig. 5 of the present invention.

1. In the compressing recycle of Fig. 5, the loop 73 of the high pressure output 75 generate hot power and the loop 85 of the low pressure output 83 generates cool power. The output cool and hot power can be used at any place with the heat exchanger.
2. In the compressing recycle, the high pressure outputs ends 75, 73 generate hot power. When the hot power is transferred to the load so that the temperature achieve to a set value, then the three way servo valve 3 operates. Hot gas is drained out from the fan motor 13 through the heat exchanger. The cool power outputs 83, 85 can operates continuously.
3. In the compressing recycle, lower pressure output end 83, 85 generate cool power. When the cool power is transferred to the load so that the temperature achieves a set value, the heat exchanger 7 operates. Cool gas drains out from the fan motor 13 through the heat exchanger 12. The heat outputs 75 and 73 can operate continuously.
4. In the compressing recycle, when the hot power of the load achieves a set temperature, the three way servo valves 7, 5 operates and the mainframe stops.

(5) Loop control described of Fig. 6 of the present invention.

1. In Figs. 5 and 6 of the present invention, the same power function is outputted. The heat exchanger 77 operates as a heat exchanger for exchanging cool and hot power.

2. In the compressing recycle, the load of the high pressure outputs 75, 73 achieve a temperature setting. The three way servo valves 3 and 19 operate and the heat exchanger is as a condenser.
3. In compressing recycle process, the load of the low pump outputs 83, 85 achieve a temperature setting. The three way servo valve 3 operates and the heat exchanger 12 is as an evaporator.
4. In the compressing recycle process, the outputs of the condenser 5 and the evaporator 9 are to the load and the temperature achieve a set value, the three way servo valves 7 and 5 operates and the mainframe stop.

(6) Loop control description of Fig. 7 of the present invention.

1. The multi-functional exchanger of the present invention contains a hot and heat dual heat exchanger system.
2. When the input 91 is hot fluid, the output 66 is as warm gas.
3. When the input 91is cool fluid, the output 66 is cold gas.
4. When the input 91 has hot and cold fluids, the output 66 is used for moisture removing.
5. The multi-functional exchanger can be inputted with various energies for generating a plurality of or a single power output. The multi-functional exchanger can output for example warm gas, cool gas, moisture removing and other functions.

(7) Loop control description of Fig. 9 of the present invention.

1. In Fig. 9, the outputs from the devices of Figs. 5 and 6 are combined with heat exchanger , etc. for further applications. The outputs of high pressure tubes 75, 73 and low pump tubes 85,

83 are used with various heat exchanger system to be used in different spaces.

2. The high pressure tube output 73 returns 73 to 202 heat exchanger for using with the hot water storage tank to generate hot power for using in hot water.
3. The high pressure tube output 73 returns 73 to 203 heat exchanger for using with the blower as warm gas.
4. The low pressure tube output 85 returns 83 to 204 heat exchanger for using with a blower as cold gas.
5. The low pressure tube output 85 returns 83 to load 205 heat exchanger for using with the cold water storage tank to generate hot power for using in cooling, such as ice water and cold fluid.
6. The low pressure tube output 85 returns 83 to 206 heat ice water storage tank for using in ice water.

The effect of the multi-functional exchanger will be described herein.

1. In low temperature or winter, air conditioner stop to operate, the heating system can be actuated to have necessary hot fluid so as to save power and no noise generates.
2. The heating system can be used to generate hot water, vapor, moisture adding and can be used to a desired space. No compressor is actuated and thus power is saved.
3. By the switching of the three way servo valve, the air conditioner can provide cold and hot fluid in summer. In winter, as cold gas is not used, the present invention can provide hot water in the whole year so as to be used in any place in a whole year. No boiler is necessary.
4. The heat in high pump side is absorbed by the heat exchanger. The heavy cooling tower is used. No wet and dirt generate so as to

achieve the object of environment protection.

5. The multi-functional exchanger uses with heat exchangers and combines with a network so as to make the system more useful and novel.
6. The compressing recycle can be used to other power saving device so as to achieve the object of power saving and cost down and the temperature is maintained in a constant temperature.
7. In the compressing recycle of the multi-functional exchanger of the present invention, the cool and hot power can be reused for saving power and the warm room effect can be reduced due to heat drainage is reduced so as to achieve the object of environment protection.